REMARKS

At the Examiner's request, a telephone conference was held to explain the calculations at page 3 of the Response After Final for this application dated September 5, 2007. During the conference held on September 18, 2007, inventor Sievert and the undersigned attorney discussed the calculation of the atom percent chromium figures. Basically this involved (a) pointing out (by calculation from the individual atomic weights) that the molecular weights of the chromium oxide and zinc chromite were 152 and 233.4, respectively; (b) calculating that the 50g and 1000g portions of the 5% example represented .33 moles and 4.28 moles respectively (containing .66 atom equivalents and 8.56 atom equivalents of Cr, respectively) and confirming that this corresponds to the zinc chromite containing about 93 percent of the chromium; and (c) calculating that the 150g and 1000g portions of the 15% example represented .99 moles and 4.28 moles respectively (containing 1.98 atom equivalents and 8.56 atom equivalents of Cr, respectively) and confirming that this corresponds to the zinc chromite containing about 81 percent of the chromium.

I.

In the Office Action, claims 1 through 7 were rejected under 35 U.S.C. 112, first paragraph as failing to comply with the enablement requirement. The Office Action maintained that the claims contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains to make and/or use the invention. The Office Action indicated inter alia that the instant claims are drawn to a chromium-containing catalyst composition "containing zinc chromite and crystalline alpha-chromium oxide and 10-67 atom percent of chromium in the composition, and at least 70 atom percent zinc in the composition and at least about 90 atom percent of the chromium present as chromium oxide in the composition is present as zinc chromite or crystalline alpha-chromium oxide"; and that the instant disclosure "provides no guidance for "atom percent chromium" or atom percent zinc" recited in its claims".

The Examiner is respectfully referred to Claim 1 itself for the correct atom percent limitations contained therein. Applicants respectfully submit that there is clearly guidance on how to make Claim 1 compositions; and the Examiner is referred to the description starting at page 3, line 5. Moreover, Applicants submit that the meaning of "atom percent" and the calculation of the percentage of atoms of an element that is in a particular portion of the composition are concepts that are readily understood by one of ordinary skill using very basic chemical calculation principles. In this regard, Applicants note that the calculation example appended to the Examiner-Initiated Interview Summary accompanying the Office Action is not entirely in accord with Applicants record as summarized above. In particular, with regard

to step 4, Applicants submit that the objective was to determine the atom percent of chromium in the zinc chromite portion (compared to the total chromium in the zinc chromite plus chromium oxide portions) and not the atom percent in the composition. Accordingly, as detailed more fully above, Applicants attempted to explain that dividing 8.56 by 8.56 + 0.66 confirms that the zinc chromite contained about 93 atom % of the chromium in the "5% example". As noted above, parallel calculations for the "15 % example" were also discussed and it was attempted to explain that in that example the Cr2O3 contained 1.98 atom equivalents Cr and that dividing 8.56 by 8.56 + 1.98 confirms that the zinc chromite in that example contained about 81 atom % of the chromium in the "15% example".

To further exemplify the use of basic calculations of atom percent, Applicants note that in Preparation Example 4 of the present application, 0.8 moles of Cr and 0.2 moles of Zn were used to make the catalyst composition where the resulting catalyst contained $ZnCr_2O_4$ and α-Cr_2O_3 (i.e. eskolaite). Since essentially all of the Zn in the catalyst composition was present as $ZnCr_2O_4$, the $ZnCr_2O_4$ can be estimated to contain 0.2 moles of Zn and 0.4 moles of Cr; and since essentially all the remaining Cr in the catalyst composition was present as α-Cr_2O_3, the α-Cr_2O_3 can be estimated to contain 0.4 moles of Cr (i.e., the original 0.8 moles less the 0.4 moles present in $ZnCr_2O_4$ portion.) Accordingly, with reference to the terminology in claim 1, these basic calculations show that $ZnCr_2O_4$ contains about 50 atom percent of the chromium in the composition and about 100 percent of the chromium present as chromium oxide in the composition is present as $ZnCr_2O_4$ or crystalline α-chromium oxide in the composition. Applicants further note that 0.2 moles of $ZnCr_2O_4$ weighs about 46.7 grams and 0.2 moles of Cr_2O_3 (containing 0.4 atom equivalents of Cr) weighs about 30.4 grams. Accordingly, the calculated weight percent of $ZnCr_2O_4$ in the composition is 60.6%, which is consistent with the weight percent determined by the X-ray powder analysis given in the Preparation Example 4.

Applicants submit that compositions containing other percentages of Zn and Cr can be analogously prepared and the atom percentages in the resulting compositions can be readily calculated in the manner similar to above. Accordingly, Applicants submit that preparation of the catalyst compositions of claims 1 through 7 are sufficiently described and illustrated in the application and are thus clearly enabled.

II.

In the Office Action, claims 8 through 14 were rejected under 35 U.S.C. 112, first paragraph as failing to comply with the enablement requirement. The Office Action maintained inter alia that the claims are geared towards the process of using the catalyst composition of claims 1 through 7; and that enablement was not reasonably provided for the chromium-containing catalyst composition recited in claims 1 through 7.

As noted above, Applicants submit that preparation of the catalysts as described and illustrated in the application is clearly enabled. Accordingly, Applicants submit that processes of claims 8 through 14 are also enabled.

III.

In the Office Action, claims 15 and 16 were rejected under 35 U.S.C. 112, first paragraph as failing to comply with the enablement requirement. The Office Action maintained inter alia that the claims are geared towards the method of making the catalyst composition of claims 1 through 7; and that enablement was not reasonably provided for the chromium-containing catalyst composition recited in claims 1 through 7.

As noted above, Applicants submit that preparation of the catalysts as described and illustrated in the application is clearly enabled. Accordingly, Applicants submit that processes of claims 15 and 16 are also enabled. In particular, as illustrated above with regard to the Preparation Example 4, atom percentages of products prepared in claims 15 and 16 can be readily calculated by one of ordinary skill in the art using fundamental stoichiometric relationships.

IV.

In the Office Action, claims 1 through 3 and 15 were rejected under 35 U.S.C. 112, second paragraph as being indefinite. The Office Action maintained that the term "about" rendered these claims indefinite.

Applicants submit that term "about" does not render claims 1 through 3 and 15 indefinite. Indeed, in Ex parte Eastwood, Brindle and Kolb, 163 USPQ 316 (1968) the Patent Office Board of Appeals specifically found that the descriptive word "about" is not indefinite. (see also MPEP 2173.05(b)A.) In any event, new claims 17 through 20 have been added, and these new claims do not contain the term "about".

V.

In the Office Action, Claims 1 was rejected under 35 U.S.C. 112, second paragraph as being indefinite. The Office Action maintained that this claim recites " catalyst composition comprising chromium containing catalyst composition comprising zinc chromite and crystalline alpha-chromium oxide and 10-67 atom percent of chromium in the composition, at least 70 atom percent zinc in the composition and wherein at least 90 atom percent of the chromium present as chromium oxide in the composition is present as zinc chromite or crystalline alpha-chromium oxide"; and that it is unclear how the at least 90 atom percent will be measured relative to the 10-67 atom percent in the composition (i.e. the 90 atom percent will render the net atom percent of Cr to be lower).

The Examiner is respectfully referred to Claim 1 itself for the correct atom percent limitations contained therein. Applicants maintain that it is readily apparent that at least 90 atom percent of the Cr present as a chromium oxide species in the composition can be present as either zinc chromite ($ZnCr_2O_4$) or crystalline alpha-chromium oxide (α-Cr_2O_3), and that at the same time from 10 to 67 atom percent of the chromium in the composition can be in the form of zinc chromite. This is particularly illustrated above with regard to the Preparation Example 4 wherein about 50 atom percent of the chromium was in the form of zinc chromite, and about 100 atom percent of the chromium is in the form of zinc chromite or crystalline alpha-chromium oxide.

VI.

In the Office Action, Claims 1 through 16 were rejected as anticipated by, or in the alternative rendered obvious in light of U.S. Patent Application Publication US 2001/0011061 by Scott et al. The Office Action maintained that the instant claims are drawn to a process for changing the fluorine distribution in a halogenated hydrocarbon, or incorporating fluorine in a saturated or unsaturated hydrocarbon, in the presence of chromium-containing catalyst compositions by reacting said compound with hydrogen fluoride in the vapor phase; that Scott et al. teaches in page 3 example a chromia catalyst containing 1% by weight zinc prepared by mixed metal hydroxide precipitation technique that engages the use of 4 L 1M chromium nitrate, 12 ml 4M zinc nitrate, 740 ml 0.88M NH4OH – heated at 425deg C for 16 hours, cooled with N2 gas with 45% crystallinity; that the catalyst so prepared in the Scott et al. page 3 example was used for the fluorination of chloro-2,2,2-trifluoroethane under HF to yield 1,2,1,2—tetrafluorethane (sic, actually 1,2,2,2—tetrafluorethane) ; that it would have been obvious to a person or ordinary skill in the art to use the fluorination process with the parameters disclosed therein with the chromia catalyst disclosed therein. The Office Action suggested that absent a clear showing of calculations, the chromia catalyst taught by Scott et al. are equivalent to the instant catalyst and would therefore be useful for the equivalent instant fluorination process.

Applicants note that Example 1 uses about 0.048 moles Zn (0.012 liters x 4 moles Zn/liter) and 4 moles or Cr (4 liters x 1 mole Cr/liter) and thus a mixed metal nitrate solution containing about 1.2 mole percent Zn based on the total amount of Zn and Cr in the solution (0.048/4.048). Accordingly, even if all of Zn in Example 1 forms $ZnCr_2O_4$, only 0.096 atom equivalents of Cr will be contained in the 0.048 moles $ZnCr_2O_4$ present, and remaining 3.904 moles of Cr (i.e., 4.000-0.096) will be present in another form. Thus the $ZnCr_2O_4$ will contain only about 2.4 atom percent of the Cr in the composition (i.e., 0.096/4.000 x 100%).

Compositions wherein $ZnCr_2O_4$ contains only about 2.4 atom percent of the Cr in the composition are clearly different from compositions of Claim 1 which covers certain compositions wherein $ZnCr_2O_4$ contains between about 10 atom percent and 67 atom percent of the chromium in the composition.

Moreover, Applicants note that Scott et al. provides catalysts containing chromia where the chromia is preferably of limited crystallinity - less than 50% (see section [0006]). In contrast, Applicants note that the amount of crystalline alpha-chromium oxide in the Claim 1 compositions is at least about 70 to 89% (depending on the amount of chromium present as zinc chromite). The minimum chromia crystallinity can be calculated from the chromium percentage in the composition that is not associated with zinc chromite together with the requirement that at least about 90% be present as either zinc chromite or crystalline alpha chromium oxide: that is when only about 10 percent of the chromium is contained in zinc chromite, then at least about 80% of the remaining 90% of chromium oxide species (i.e., about 89%) is present as crystalline alpha chromium oxide; and when about 67 percent of the chromium is contained in zinc chromite, then at least about 23% of the remaining 33% of chromium oxide species (i.e., about 70%) is present as crystalline alpha chromium oxide.

Accordingly, Applicants submit that compositions of Claim 1 are neither disclosed nor fairly suggested by Scott et al., particularly Example 1 therein which reportedly had an apparent crystallinity of about 45% (see section [0033]). Moreover, Applicants note with respect to claims 10 through 14 that section [0001] of Scott et al. clearly indicates that invention therein relates to a fluorination catalyst and the production and use thereof; and Applicants submit that Scott et al. neither discloses nor fairly suggests reactions involving chlorofluorination, isomerization, disproportionation, dehydroflurination, or hydrochlorination.

VII.

The Office Action suggested that at line 7, page 13, there is missing information for the PCT reference stated.

Applicants respectfully refer the Examiner to the Amendment for this application dated May 29, 2007, which includes an amendment to the specification at the indicated location.

In view of the foregoing, allowance of the above-referenced application is respectfully requested.

Respectfully submitted,

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